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AUTHOR Gilbertson, Alan D.
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ABSTRACT

This publication is intended to help production staff understand (1) what job specifications are, (2) why written specifications are important, and (3) what is involved with documenting specifications. A definition of job specifications is followed by a discussion of the importance of and necessity for such specifications as regards the rehabilitation facility. The section on determination of job specifications is divided into two parts. The first part discusses the requirements of materials for the job and their relationship with shipping/receiving, manufacturing control, and quality control. The second part of this section discusses manufacturing specifications from the standpoint of the support services restrictions placed upon the manufacturing of the product, namely shipping/receiving methods, manufacturing control, and quality control. Forms and checklists are appended. (YLB)

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DETERMINING JOB SPECIFICATIONS

A MANUAL FOR

REHABILITATION WORKSHOPS

BY

ALAN D. GILBERTSON

APRIL, 1982

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INTRODUCTION

Determining clear and accurate job specifications for a proposed job is an important function of the workshop's contract department. The failure to properly determine the specifications of the job and the production methods available for the job can result in an inaccurate bid being submitted to the business concern. The acceptance of a contract job where costs are only partially determined can result in lowered revenue for the workshop. In order to determine more accurately the costs of doing the work, the workshop must examine the job specifications to determine: what is to be done; the materials to be used; the production deadline(s); the requirements of quality control; equipment and machinery needs; the skills required of employees to complete the work; and, other factors which will help identify the job. The more detailed the specifications of the job, the easier it will be to determine if the job can be completed by the workshop and the costs necessary to complete the job.

The workshop should, for a majority of contract jobs, be able to develop written job specifications prior to submitting bids to contractors. Such thorough knowledge of jobs starts the workshop in a positive direction--one which will result in revenues similar to those projected for on the bids. On occasion, the workshop may have little time to prepare detailed written specifications before submitting a bid. Information contained in this publication will assist the reader in identifying specifications which must be determined as they are directly related to the costs of doing the work.

The purpose of this publication is to help production staff understand: (1) what job specifications are, (2) why written specifications are important, and (3) what is involved with documenting specifications. By understanding these concerns, production staff will gain important insight into the relationship among written job specifications and doing the job and, thus, provide the opportunity for better financial management and facility operations. A checklist has been provided which can be used by the workshop when preparing written job specifications.

Alan D. Gilbertson, M.S.

April, 1982

JOB SPECIFICATIONS

When the contract procurement specialist for the rehabilitation workshop makes contact with a potential customer, the outcome can be in the form of a job contract on which the workshop may make a bid. More than one meeting may be required in order to obtain such a job order.

A positive outcome of the meeting is when the potential customer provides the workshop with a sample, prototype, or drawings and specifications of a job. The contract procurement specialist must then, either independently or jointly with the workshop, evaluate the job to be completed and its suitability to the needs and capabilities of the workshop. At this point, it becomes important for the workshop to determine accurate job specifications.

WHAT EXACTLY ARE JOB SPECIFICATIONS?

Job specifications are accurate descriptions of the technical requirements for products, services, or materials. Assuming the form of written descriptions, diagrams, drawings, or industrial standards, they specify: materials involved, quantities to be produced, what is to be done, how it is to be done, minimum quality control requirements, and date(s) for completion of the work.

WHY ARE JOB SPECIFICATIONS IMPORTANT AND NECESSARY FOR THE REHABILITATION FACILITY?

There are six important reasons for having job specifications.

1. Documented job specifications provide valuable information for the workshop in its determination as to whether or not it wants the job, can complete the job correctly, or can financially benefit from the job.

Written job specifications provide valuable information while the workshop is still in the planning stage--while it is still deciding whether to bid on or accept the proposed job. During this time, the workshop is attempting to find out as much as possible regarding the job. Factors the workshop will want to explore include: shipping/receiving requirements of materials and finished products; levels of acceptable quality for in-coming materials, materials in process, and outgoing products; manufacturing requirements of the job; and, determining who (the facility or the contractor) is responsible for supplying materials, equipment, and machinery necessary to complete the job. Accurate specifications on the above factors provides the facility with sufficient information necessary to determine if it is interested in completing the job. Knowing manufacturing and quality requirements clues the workshop as to whether it has the manpower skills and machinery and equipment necessary to correctly complete the job. Last, and most importantly, the

workshop can more accurately project the costs of accepting and completing the job as well as the anticipated revenue to be gained.

2. Documented job specifications assist the workshop during production scheduling, when purchasing materials, and in the selection of employees for the job.

Written job specifications include information pertinent to production scheduling, such as: shipping/receiving dates of materials and finished products; the quantities to be produced; and job materials which must be supplied by the facility. Hietala (1980) stated that production scheduling is a "... planning process for determining: (1) what has to be done, (2) how long it will take, (3) who will work on which job, and (4) when to begin and finish each production job" (page 1). Production scheduling is one tool the workshop can use to maximize profits. As discussed in point one, job specifications detail when the job will arrive at the workshop, and when the completed products must be shipped from the workshop. The quantity to be produced is also detailed on the specifications form. Knowing the quantity to be produced and production time allowed, the workshop can schedule the job. When the production department's job orders are low, the workshop can either: (1) assign a few employees, or (2) assign all that are available and capable of completing the work. The workshop may opt to assign only a few employees so that the job is processed during the entire time span agreed upon by the contractor and workshop. Normally, the longer employees are on the job, the more proficient they become. Quality and quantity of work should increase. The assignment of a few employees to the job means that fewer will need to be trained on the job by the supervisor.

The workshop may decide to assign as many employees as are available and capable to the job. This affords the workshop the opportunity to place most employees on a job instead of having them idly sitting, awaiting some other job. Depending on the length of the job, this is a short, temporary situation. When the job ends, the employees will once again be sitting. Hopefully, another job will be secured before the current job is completed.

Observe the chart on the following page which compares the advantages and disadvantages of assigning a minimum or maximum number of clients to a job. Besides being used as a tool for maximizing profits, production scheduling can also provide for more effective supervision. The production schedule indicates to the department and the supervisor what has to be done, who will do it, when it will be done, and how much will be produced. It establishes supervisory accountability for the job.

Job specifications are helpful when materials must be purchased. Information obtained should include: quantities required; dimensions, weights, sizes, etc., of materials; acceptable levels of quality the materials must meet; where they can be obtained; when they must be secured and received at the workshop; and, the manner in which they will be shipped to the workshop. With this information, the workshop purchasing agent (bookkeeper, order clerk) can obtain quotes and make purchases. Errors associated with incorrect material purchases will become less common.

	Minimum # Assigned	Maximum # Assigned
Advantages	1. Ease of training 2. Lower supervision - employee ratio 3. Maximum job exposure (familiarity) 4. Higher proficiency (quality/quantity)	1. Maximum # clients are working (not idle) 2. Allows job to be completed in shorter period of time
Disadvantages	1. Maximizes length of time to complete job - if delays occur/job could become late 2. Capable and ready clients may be sitting not placed on job	1. Higher supervision - employee ratio 2. Minimum job exposure 3. Difficult to train many 4. Higher risk of unacceptable quality and quantity

Finally, job specifications are helpful when employees are to be selected for the job. Information obtained should include: requirements of the job, such as skills, aptitudes and quality, and the quantity to be produced during a given period of time, such as in a day, week, or a month. A review of the performance evaluation for each employee should indicate the rate of productivity (100% being industrial "normal" production rate). Employees whose quantity and quality levels meet or exceed those required to complete the job can then be selected for the work. This reduces the chances of placing employees on the job whose skills are not acceptable, and thus reduces the chances of poor quality being turned out by the workshop.

3. Documented job specifications reduce job parts errors while increasing efficiency on the job.

Written job specifications describe in detail each piece of material used on the job. The description can assume the forms of size, color, dimension, weight, diagrams or pictures. The more descriptive the information, the less chance that wrong materials will be shipped in to and used by the workshop. Through inspection of materials, it should be easier to judge what is unacceptable quality. When errors are reduced, efficiency on the job will approach projected or anticipated levels.

4. Documented job specifications reduce individual errors associated with what is meant by acceptable production.

Written job specifications include descriptions of acceptable and unacceptable quality. This applies to raw materials, goods-in-process, and finished goods. Shipping/receiving clerks, supervisors, and employees are better able to determine what to set aside (as unacceptable) and what to go ahead and do.

5. Documented job specifications make individual employees responsible for maintaining acceptable work tolerances.

When employees start working with incomplete or incorrect instructions, they are more likely to turn out faulty production. Thus, employees should be considered part of the process flow of production for the product. If they make mistakes, they change the process flow. When the job specifications are accurate and not left to interpretation by individuals assigned to the various work tasks, the work stands a better chance of being completed correctly. If specifications are documented, both the supervisor and the employees should be aware of what constitutes acceptable work. Then, when a job, or one specific component of a job is found to be unacceptable, documented job specifications assit in locating the employee who, for some reason, has begun turning out unacceptable work.

6. Documented job specifications provide valuable information for future jobs which are similar and reduces the need for recomputation of materials and manufacturing specifications.

When the workshop has researched and developed accurate specifications for a specific job, it simplifies and reduces the amount of time required for determining materials and manufacturing specifications on future jobs which are similar in nature. A permanent record file of documented job specifications for each job accepted by the workshop can provide immediate access to information useful when preparing specifications for future, similar jobs. Some ways in which documented job specifications provide immediate access to information necessary for planning for future jobs include the following:

(1) materials requisitioning - know who supplies the materials, the approximate cost of the materials, order and delivery times, delivery method, etc.

(2) job set-up - know job layout design(s) that are most efficient, know machines, equipment, and tools required for the job as well as their production capabilities, etc.

(3) employee selection - aware of worker tolerances, skills, aptitudes, etc., necessary to complete specific job tasks, may have list of clients capable of completing job tasks correctly.

(4) manufacturing process - know points where job should be inspected to insure acceptable quality, know correct packaging/shipping methods for completed products.

(5) job duration - know approximately how long job takes to complete, knowing variables such as number and types of clients assigned to the job.

(6) job problems - aware of production problems associated with the job.

DETERMINING JOB SPECIFICATIONS

The subject of documenting job specifications will be approached from the standpoint of the support services restrictions that are placed upon the materials and process required of a job. For example, materials will be discussed as they relate to shipping/receiving methods, manufacturing methods, and quality requirements. Likewise, the process of doing the job will be discussed as it relates to the three major support categories. Observe the following diagram:

The first part of this section will discuss the requirements of materials for the job and their relationship with shipping/receiving, manufacturing control, and quality control. In addition to discussion on each of these areas, forms and/or checklists will be provided for the reader. The workshop should, whenever considering a new or the renewal of a contract job, complete the checklists provided so as to better determine whether the job can be completed correctly, accurately, and within determined costs.

Part 1: Material Specifications

Material specifications should state clearly what each material required for a contract job must be, with limits on tolerances to specifications where appropriate. They should stipulate quality standards that the workshop can easily check and, whenever possible, the specifications should be capable of being met by several vendors. Without proper and realistic specifications, vendors cannot deliver desirable materials to the workshop. This means that the workshop must have received clear specifications for materials from the contractor.

Well drawn-up specifications secure the combination of properties desired in materials, gain uniformity of quality, facilitate quotation comparisons, avoid undue variety in items and thus reduce inventories, and promote efficient purchasing and rapid deliveries.

If materials are purchased without specificiations by the workshop, the purchasing department must assume the responsibility for any failure of the materials to perform. Thus, purchasing must demand the preparation of specifications from the contract procurement specialist and inform management of the workshop if none are provided.

As stated previously, material specifications can be approached from the standpoint of the support services restrictions placed upon the materials, namely shipping/receiving methods, quality control, and manufacturing control. Each will be discussed.

A. Shipping/Receiving Specifications of Materials

When a workshop accepts a contract job, raw materials, equipment, and machinery required for processing the job must be procurred, either from the contractor, in-house, or another outside source. To aid in the proper selection of materials to be used for the contract job, the workshop should prepare written material specifications and give them to the source providing the materials. Not only will errors of interpretation be lessened, but also, time will be saved in locating the specified material.

Shipping/receiving specifications of materials can be broken into three areas: (1) purchasing specifications, (2) packaging specifications, and (3) delivery specifications. Purchasing specifications should specify accurately and precisely the materials and parts to be purchased. Dimensions, proportions and any other aspects of material size should be stipulated, along with other characteristics of importance, such as weight, color, surface hardness and finish, tensil and dielectic strength, and elasticity. Buying proper quality depends on having accurate specifications from which to work, placing orders with reliable vendors, and checking material and parts purchased against specifications. A specification is no more than an accurate description of the material to be purchased.

Purchase specifications can be prepared with the following materials quality restrictions, the first three of which are the most commonly used:

1. trade or brand names, i.e., tools, machinery
2. commercial standards and tolerances
3. blueprints and drawings with dimensional standards
4. market grades, i.e., lumber, beef
5. chemical analysis or physical characteristics, i.e., raw metals
6. description of purpose or use
7. vendor's sample
8. workshop's sample

Purchase specifications by trade or brand name should be used only where the branded product is found to be superior to all others for the intended purpose. Otherwise, the workshop is placed in the situation of being dependent upon the vendor's reputation for quality. Purchase specifications by description of purpose or use, on the other hand, is highly effective. This form of specification is easy to prepare and is especially useful in the purchase of machines or tools about which the workshop has no particular technical knowledge.

Many workshops, however, will find that much of which they order in terms of materials and parts will depend solely on that which is described in order catalogs and on price sheets. For example, a workshop requiring cardboard containers for packing completed products may find the type of container they require after reading catalog container descriptions. At that point, all that remains is to order the containers according to the description title and catalog number, if any. The price of the material also assists in identifying the ordered material.

Packaging specifications, a second area within shipping/receiving specifications of materials, should specify how the product should be protected during shipment to the workshop. When the contractor assumes the responsibility for shipping materials and parts to the workshop, packaging specifications will not need to state anything further than to that effect. If, however, the workshop either transports materials and parts to the workshop by its own vehicle, or employs an outside transport firm to do so, then packaging specifications become increasingly important. Incorrect or incomplete packaging specifications may result in materials and parts being damaged while in transit to the workshop, and the workshop may find itself in the predicament of compensating the contractor for damages.

When the workshop orders materials and parts from outside sources and the sources are responsible for delivery of goods to the workshop, once again packaging specifications are not required. After all, if the supplier damages his own goods, he will need to replace them. But, if the workshop either picks up and transports the materials to the workshop, or has a shipping firm do so, it is accepting the materials in good condition. Thus, the workshop should have accurate packaging specifications which state how the material is to be packaged. This should insure that materials will arrive undamaged at the workshop.

The third area of shipping/receiving specifications of materials concerns itself with delivery specifications. Delivery specifications should specify when and how the material and parts should be shipped to the workshop. It can be stated either as a date on which materials are to be shipped to, or as a date on which materials are to arrive at the workshop. The latter is preferable since the workshop does not have to compute the time allowed for transit of goods from the vendor. The best assurance of the delivery date being met is to include in the contract a penalty clause for failure to deliver as promised. Penalties could be at a stated rate for each day of the failure to deliver acceptable material or parts. This serves as an added inducement not only to deliver on time, but also to deliver good quality materials. While the vendor may have to take back unacceptable materials and replenish with good materials, the workshop may find itself in a situation

where it will be unable to meet agreed upon contract deadlines. Thus, workshop production and shipping dates may be contingent upon the receipt of incoming raw materials at the anticipated time.

From this discussion then it can be seen that shipping/receiving specifications for incoming materials and parts should include a statement of the point at which goods are to be delivered, routings, instructions concerning packing material, destination of method of shipping, i.e., parcel post, express, freight, workshop vehicle, etc.

It now becomes important for the workshop to acquire specific information related to the following shipping/receiving specification items. Each of the items is discussed briefly. Each item also appears on the job specification checklist which is included at the back of this publication.

Shipping/Receiving Requirements For Incoming Materials

- How are the materials and parts to be shipped to the facility?

With any contract job the workshop may be deciding to undertake, it must be determined who the party or parties are that will see to it that materials and parts are shipped to the workshop. The workshop must determine this if it is to develop accurate freight costs in connection with the contract bid.

- contractor's vehicle

When the contractor specifies that materials and parts are to be shipped to the workshop by means of his vehicle, the workshop should determine exactly what will be shipped and specify it on the shipping/receiving job specification sheet.

- workshop's vehicle

When the contractor specifies that materials and parts to be shipped to the workshop is the responsibility of the workshop, it is important that the workshop determine what and how the materials will be shipped. This is a freight expense for the workshop bid. If the workshop will be using its own vehicle, specify it on the specification sheet as well as what will be shipped.

- vendor's vehicle

A vendor(s) may be responsible for shipping materials to the workshop. If the contractor has arranged for this, there should be no charge to the workshop. However, should the workshop purchase materials from a

vendor, there may be charges for having the vendor deliver the materials. This should be specified on the job specification sheet as it may be a freight expense for the contract bid.

- common carrier

  When common carriers are employed to deliver materials to the workshop, the specifications sheet should state the name/address and other necessary information regarding the carrier as well as identifying the material shipped by the carrier. It should be specified who is to secure the common carrier--the contractor or the workshop.

- contractor secures common carrier

  The workshop should specify that the contractor will have materials delivered by common carrier and also specify who the common carrier will be.

- workshop secures common carrier

  Again, it should be specified who the common carrier will be as well as the materials being delivered. Since the workshop is negotiating for the carrier, it will most likely assume costs associated with hiring the carrier. This should be added to the freight expense section of the contract bid sheet.

- What are the expected dates of shipping and receiving?

  The date(s) incoming materials are to be transported to and received by the workshop is important for several reasons. First, the information is required should the workshop be expected to schedule transportation of the materials. It must inform its driver or the common carrier of the scheduled shipping and arrival dates. Second, the information is required for the workshop to properly schedule production. The workshop may find that it is unable to accept the job because the production time conflicts with other jobs currently in production. In some instances, the workshop may be able to change dates with the contractor and, thus, be able to accept the job.

- When will the materials be shipped from points of origin?

  For each of the transportation methods discussed above, the workshop should specify the date(s) that materials are to be shipped from points of origin. This becomes important especially when the workshop must arrange for materials to be shipped to the workshop. Common carriers need to be informed of the date on which they must transfer materials from points of origin.

- When are the materials expected to arrive at the workshop?

  Again, for each of the transportation methods discussed above, the workshop should specify when the materials are expected to be received at the workshop. This is required information for production scheduling. Common carriers must be informed of the date(s) on which materials must be delivered to the workshop.

- What are the points of origin for incoming raw materials?

  The workshop must specify the location where each of the materials required for the contract job are to be picked up. This is especially important when the workshop instructs its vehicles or common carriers to transport materials to the workshop.

- What is being delivered to the workshop?

  The workshop or contractor should specify the materials to be delivered by description, purpose, name, dimensions, weight, quality, or other identifying marks; otherwise, delay errors may occur in delivering correct materials. Time can be of an essence. Production schedules are thrown off balance when time is required to return unwanted materials and obtain correct materials.

- What method(s) of packing are to be used when transporting materials to the workshop?

  The workshop or contractor should specify the method in which materials are to be packed for shipment to the workshop. Most often this will have been taken care of by the contractor. The method of packing, i.e., pallets, boxes, bins, or bulk may help determine whether the workshop will be able to use one of its vehicles or be required to hire a common carrier. The method of packing also clues the workshop as to how the materials will need to be unloaded, i.e., forklift or by hand. Finally, the method of packing can assist in planning for storage at the workshop, i.e., bulk may consume more room than when stacking bins.

- Is special handling or added freight insurance required for the material?

  Occasionally, materials must be handled in a certain manner to reduce chances of damage in shipment. If the workshop assumes responsibility for transporting materials to the workshop, whether by own vehicle or by common carrier, it should determine the method of handling. Special handling requirements may be the sole determinant of the method of transportation. Added freight insurance may be required to protect the materials in transit. Also, special handling may increase costs associated with transportation when a common carrier is procurred.

B. Quality Control Specifications of Materials

Before a workshop bids on a future contract job, it must be aware of the quality requirements expected by the contractor. Failure to take this into consideration can mean increased costs or loss of the job. One major component of quality control for any job is the degree of quality imposed on raw materials being delivered to the workshop. In theory, materials meeting quality specifications when received at the workshop will be satisfactory in the end product. If they fail, the specifications may be wrong for the material, its processing, or its tolerances.

Reliable incoming quality control means having correct basic materials/supplies coming in to the workshop from vendors. Incoming Quality Control is the procedure for determining whether incoming materials meet predetermined quality specifications. Usually, this is some form of sampling inspection carried on in the receiving department. Unfortunately, this critical inspection is not always done thoroughly. One reason is that the receivers do not have accurate specifications to apply to the incoming materials.

What must the workshop include within its specifications related to quality for incoming materials?

- What are the materials?

Materials may be designated or specified in a number of ways:

- common trade or brand names

The use of specific terms or indicators, such as the common symbols, codes, manufacturer's catalog symbols, brand names, or trade names or designations can assist the individual receiving the materials in correctly identifying the materials.

- descriptions of the materials

Descriptions of the materials can assume several forms: written, photographs, schematic diagrams, and blueprints. Each assists in correctly identifying the material received at the workshop. Descriptions may also provide measurements, such as dimensions or proportions.

- specifications (specs)

Specifications may assist in designating what the materials to be received are and can be made available from several sources: manufacturer's specs, trade specs, engineering society standards or other recognized specs, laboratory specs, government specs, or the workshop through its own research. In addition to any description of the

material, specifications can include information relative to quality or composition, ratings of performance, methods of analysis or test, and specific requirements as for safety.

The workshop, when preparing written specifications related to the quality requirements of incoming materials, must identify what the materials are that will be received at the workshop. Not only is the job of the shipping/receiving clerk made easier, but delays and errors are lessened when the materials are identified as being correct the moment they arrive at the workshop.

- Is one type or brand recommended or preferred over another?

  The decision regarding the type or brand of materials can depend on a number of factors: contractor's requirements or preference, availability of and accessibility to the materials, and cost. If a workshop orders a specific type of material from a vendor, it is easy to compare what has been received with what was ordered.

- Can materials be substituted without affecting quality?

  The workshop should specify which materials can be substituted and under which circumstances, i.e., lower price, better quality, and/or better performance. When the contractor specifies a particular brand and the workshop locates a similar but differently named product, it is important that the replacement product receives approval from the contractor before the workshop proceeds with the purchase; otherwise, the workshop may discover that it is manufacturing unacceptable products for the contractor.

- Are the materials compatible with workshop methods of operations?

  Materials can affect quality. Defective raw materials contribute to further product defects. The quality specifications of incoming raw materials must provide detailed information on the materials. The workshop must be able to examine the materials prior to doing the job. This allows the workshop time to experiment with the materials before permitting it to enter the manufacturing stage. The workshop may discover that some materials may not be compatible with machinery and acceptable substitute materials or equipment may have to be located. The materials should be checked against machinery, tools and jigs, and materials handling equipment. The workshop may find that although having the capability to complete a job, it cannot unload or move materials within the operations area.

- Which materials flaws are acceptable and which are unacceptable?

  In some instances, incoming raw materials will contain a percentage of pieces that could be regarded as unacceptable for use in manufacturing acceptable completed products. So that the shipping/receiving clerk and/

or quality control specialist for the workshop can properly check incoming raw materials, written quality specifications should describe in detail which materials flaws will be accepted and to what degree. Generally, there are three basic quality control inspection methods that a workshop can choose from for monitoring incoming raw material quality. Each represents a different degree of accuracy and time expense. The three methods are: random spot checks of the materials, simple spot checks of the materials, and screening or 100% inspection of the materials.

Random spot checks of materials are low in cost, providing relatively low quality control accuracy. This method should be used when there is a high degree of credence that the random check of the incoming raw materials is representative of the total quantity received. There exists a certain amount of inherent risk in using the random spot check method because of the continual assumption that the random check is indicative of the larger quantity. This method should only be used when the risk can be safely assumed and quality requirements are either low or nonexistent.

Simple inspection sampling plans provide workshops with a relatively accurate inspection method for determining whether material batches or lots are fixed quantities of materials. For example, a batch may be 50, 100, 500 or any predetermined number of like material pieces. This method requires that a certain number of pieces in each batch or lot be inspected. Based on this sampling, the entire batch or lot can be either accepted or rejected. Inspection sampling should be used when quality requirements are specified at less than 100%.

Screening or 100% inspection is the most costly of the three methods. This is a method in which each and every piece of material is individually inspected. Screening is the most accurate of the three methods and provides a relatively high assurance that defects will be detected before the materials enter the manufacturing process. Of course, if one individual checked each piece of material, errors could result from the monotony of screening. When fatigue sets in, the inspector's attention to detail is lowered. Screening or 100% inspection should be used when absolute quality is required, regardless of the extreme costs associated with the method. With the above three methods discussed, the workshop must decide which will be used in connection with the contract job it is considering. The quality specifications sheet should specify the inspection method to be used, the flaws which will be accepted and those that will not be accepted, tolerances of quality for the materials received, and the percentage of defects allowed per shipment, batch, or lot. Without such specifications, the workshop will have little idea of the quality of the materials received. In turn, it will not realize that unacceptable products may be manufactured at the workshop.

- Who determines acceptable quality standards for incoming raw materials?

Depending on the type of job and the relationship existing between the contractor and the workshop, quality standards can be determined in three ways: by the contractor, together by the contractor and the workshop, and by the workshop. Quality specification sheets should specify who will determine acceptable quality standards for incoming raw materials.

- Contractor determines quality standards

  Here the contractor determines all quality control standards relative to the product. Contractor determined quality control standards can be expected when quality is critical and cannot be compromised. The process of determining acceptable quality is accelerated by having the contractor generate all standards. The workshop should exercise caution in preparing a contract bid where the contractor determines quality of materials and the completed product. Failure by the workshop to identify quality costs incurred through higher levels of inspection, excessive rework, scrap, and slower manufacturing levels can result in a financial drain for the workshop.

- Contractor and workshop determine quality standards

  This method eliminates much of the potential quality control confusion inherent with the previous method. An immediate relationship is developed between the contractor and the workshop when both determine quality standards. Both are aware of the quality levels established at the outset. Neither can say that they did not realize what was required.

- Workshop determines quality standards

  Here the workshop solely is the determinant of quality standards for incoming raw materials and subsequent manufacturing of the materials. When this method is used, the contractor has not set quality control standards or guidelines and feels that quality is noncritical. In this case, the workshop may want to set its own quality control standards to maintain an acceptable level of quality.

C. Manufacturing Specifications of Materials

Whenever a workshop accepts a contract job, it must have sufficient information with which to turn raw materials into completed products. Workshop personnel must determine the most efficient method of doing the work which its clients are capable of completing. The best method of completing the job is not necessarily the one which is completed in the fewest operations, but rather the one which can most efficiently be completed by the clients assigned to the job. The workshop will want to review and include the following when preparing manufacturing specifications related to materials used for a contract job:

- Are inventory control records to be maintained for materials and supplies required for the job?

  If the contractor does not specify that the workshop maintain inventory records of raw materials, then the workshop may desire to do so itself. Why? So that written records are maintained in case verification of materials consumed and materials remaining is needed. Discrepancies in numbers can be determined at an earlier date than if records are not

maintained. When inventory control records are to be maintained, specify when the cards must be updated, i.e., daily, weekly, monthly, after each shipment.

- Is a specific type of inventory control system required?

  Specify the type of inventory control system which should be used regarding the contract job. If physical inventories will be taken, will they be annual, seasonal, or of continuous nature? Are inventory cards to be maintained? Will inventories be maintained for the storeroom or for bins of materials?

- Is a method of reporting inventory to the contractor required?

  Since most materials being used for a job are owned by the contractor, it is only proper that he receive information on inventories of materials used and remaining. If the contractor has requested specific information on inventories, specify this on the job specifications sheets. Otherwise, the workshop may decide whether it will want to send ongoing inventory reports to the contractor. For continuous jobs, this may be important since the contractor can ship additional raw materials to the workshop. One-time, low quantity jobs may not need to have inventories reported since they are finished when all raw materials have been used.

- How are materials and supplies to be handled?

  When normal handling methods can be used for moving materials and supplies throughout the workshop, specifications are not necessary. However, when precautions with moving materials are necessary, the workshop should specify the method of handling. Materials damaged in movement result in lowered revenues realized from the jobs.

- How and where are materials and supplies to be stored?

  Rather than deciding on a storage place after the arrival of raw materials at the workshop, the specifications sheets should describe material storage. Specify special conditions of storage, such as heating, cooling, freedom from dust. Specify whether the materials will be warehoused at the workshop as well as the duration of time.

- How are materials and supplies to be laid out for the job?

  When the contract has a specific job layout, then the specifications can describe the positioning of materials for the job. For example, materials may be placed at each individual work station or they may be at several key location spots within the job area. When a workshop must design how the job processing will be completed, this information will not be recorded on the specification sheets.

- What are the specifications of tools, equipment, or machinery necessary to turn materials and supplies into finished products?

  Job specification information should include sufficient description of tools, equipment and machinery used in processing the work. This information is important if the workshop is to borrow, rent, or purchase correct pieces of equipment and machinery. With accurate descriptions, the workshop is also able to determine the cost of the tools and equipment. This information is necessary for determining the contract bid price. The specifications should include the following descriptions: name or brand required, size and dimensions, safety features, and any other identifying marks or uses.

Part 2: Manufacturing Specifications

Manufacturing specifications should state clearly how each material required for a contract job should be entered into the manufacturing process of that job. Without proper and realistic manufacturing specifications the workshop cannot process and deliver acceptable completed products to the contractor. The workshop, either independently of or together with the contractor, must develop clear and accurate manufacturing specifications prior to bidding on a contract job.

The good manufacturing specification is written to assure general understanding, repeatability, accuracy, and interchangeability between machines, tooling, persons, and inspection gauges. Therefore, blueprint and shop specification requirements must be fully compatible with process capability. Both should be complete, precise, detailed, and capable of only one interpretation. Whereas blueprints tell the operator what to make, shop specifications are written instruction sheets prescribing work methods and motions. They explore the problem of how to make it. Thus, specifications cover physical characteristics of products other than finishes, form and contour, and dimensions and tolerances. They give details on materials to be used. They provide complete instructions for doing required labor operations, including specifications of best machine and tooling, handling system, inspection and performance tests required, and so on.

Job specifications are developed to assist the workshop in the completion of the job as the contractor wants it completed (at a particular time). During preplanning and later, during the production phase, workshop specifications may need to be changed for cause. For example, plant engineers may develop, or hear of improved equipment and/or tooling; or use of a new, improved material may force a change in the workshop operations performed or in the machines and work methods utilized. The workshop specification should then be changed accordingly, as of a selected effective date, and copies of the change notice should go to all holders of the workshop specifications, i.e., production supervisors, foreman, contractor, and operations manager.

If employees start working with incomplete or incorrect instructions, they probably will turn out faulty production. Thus, employees must be considered

as part of the manufacturing process flow. Incomplete or incorrect manufacturing specifications can result in two types of time losses. First is delays. When specifications are incomplete or incorrect, employees cannot figure out what needs to be done. Thus, more time is required to complete the work. There is also the tendency on behalf of the employees to want to do more work than is required for proper functioning. Employees want to make sure that they avoid criticism. So, because of incomplete specifications, they end up doing more work than what should have been necessary just "to be sure." Secondly, incorrect or incomplete specifications may lead employees to reject work that may be quite satisfactory. Such rejection may lead to extra work, additional scrap, or rework. More time is added when employees are required to inspect and sort out acceptable products from bins originally thought to contain rejected products.

Accurate manufacturing specifications allow for increased efforts by the workshop to control the quality of processes and final product performance, allow for a smoother transition in shipping completed products to the contractor, allow supervision, etc., to set up a manufacturing process which turns out acceptable products, reduce costs due to scrap, rework and customer dissatisfaction, and assist in determining the performance requirements of individuals assigned to the various tasks of the job.

As for the case in Part 1: Material Specifications, manufacturing specifications will be discussed from the standpoint of the support services restrictions placed upon the manufacturing of the product, namely shipping/receiving methods, manufacturing control, and quality control. Each will be discussed.

A. Shipping/Receiving Specifications for Outgoing Products and Unused Materials and Supplies

Upon fulfilling the requirements of the contractor, that of manufacturing the products, one final action of the workshop is to ship the completed products as well as any unused materials and supplies belonging to the contractor. Final shipping specifications should specify when and how the completed products and unused materials should be shipped from the workshop. It can be stated either as a date on which products are shipped to, or as a date on which products are to arrive at the contractor's place of business or other specified destination point. The latter is preferable because there is a better chance that the product will be at the specified destination on the required date. Shipments can be sent on a specified date, but there is no assurance they will reach their destination on the appointed time.

Shipping specifications for outgoing products and materials should include a statement of the point at which goods are to be delivered, routings, instructions concerning packing products, destination of method of shipping, i.e., parcel post, express, freight, workshop vehicle, contractor's vehicle, etc.

It becomes important now to discuss the specific information related to the following shipping specification items. Each of the items will be discussed briefly. Each item also appears on the job specification checklist which is included at the back of this publication.

- What raw materials, etc., are to be returned and to where?

  Usually, all that is needed is a statement on the specifications sheet which states: unused materials are to be returned to contractor's place of business or return unused materials to vendor and send a list of what was returned to the contractor. In some rare instances, the contractor may not want any unused materials returned and may instead donate them to the workshop to use as they desire. If so, note that materials are to remain at the workshop so that the shipping clerk is aware of it.

- How are raw materials to be shipped?

  With any contract job the workshop may be deciding to undertake, it must determine who the party or parties are that will see to it that unused materials are returned. The workshop must determine this if it is to develop accurate freight costs in connection with the contract bid.

- Contractor's vehicle

  Specify what unused materials are to be returned by contractor's vehicle. Quantities, of course, remain unknown until completion of the job.

- Workshop's vehicle

  Specify what unused materials are to be returned by the workshop's vehicle. If unused materials are shipped independently of completed goods, this will result in an additional freight expense for the workshop bid sheet.

- Vendor's vehicle

  Specify what unused materials are to be returned by vendor's vehicle. The workshop should determine if the vendor charges a cost for picking up unused materials. If the workshop must pay for the vendor's services, this will be an additional freight expense; however, it cannot be included on the contract bid since it is a variable factor. The workshop will have to bill the contractor for the vendor's charges afterward.

- Common carrier

  When common carriers are employed to return unused materials to the contractor, the specifications sheet should state the name/address and other necessary information regarding the carrier as well as identifying what will be shipped. This latter information may remain unknown until completion of the job. When the workshop pays the common carrier to return unused materials, this becomes an additional freight expense borne by the workshop. The workshop will have to bill the contractor for the vendor's charges afterwards.

- How are unused materials to be packaged?

  Specify the manner in which unused materials are to be packaged for shipment back to the contractor. This may be no more than stating that unused materials are to be packaged in the same manner in which they arrived.

- When are unused materials to be returned?

  Unused materials can be returned separately from or together with completed products. Specify when on the specifications sheet so the shipping clerk will be aware of the date(s). Whenever possible, unused materials should be returned at the same time completed products are returned. The longer materials remain in the workshop, the greater the risk that they may be damaged, etc. They also occupy space which may be needed for other jobs.

- How are finished goods to be shipped to the contractor?

  As was the case with returning unused materials, the workshop should specify how finished goods are to be shipped: via workshop vehicle, contractor's vehicle, or common carrier. The workshop incurs a freight expense when it ships via its own vehicle. This should be included in the contract bid sheet under the freight expense.

- Where are finished products to be shipped?

  Specify the shipping destination point of finished products on the specifications sheet. When more than one location is involved, list each as well as what and how much is to be shipped there.

- When are they to be shipped/when must they arrive at point of destination?

  The contractor may specify that completed products be shipped at the completion of the job, or in the case of a large contract, after a specified period of time has elapsed or "X" number of pieces have been completed. When the workshop arranges transportation, it will need to know when the products must be at the contractor's place of business.

- What finished products are to be shipped?

  Here the specifications sheet should include a description of size, weight, quantity, and name or other identifying descriptions.

- What method of packing is to be used during shipping?

  Specify whether the finished products will be packed in boxes, bins, on pallets, etc. The contractor may have his preference or allow the workshop to determine the most appropriate method of packing.

- Is special handling or added freight insurance required for shipping finished products?

  Occasionally, finished products must be handled in a certain manner to reduce chances of damage in shipment. If the workshop assumes responsibility for transporting finished products to the contractor, whether by own vehicle or by common carrier, it should determine the method of handling. Special handling requirements may be the sole determinant of the method of transportation. Added freight insurance may be required to protect the finished products in transit. Also, special handling may increase costs associated with transportation when a common carrier is procured.

B. Quality Control Requirements of Materials In-Process

When raw materials entering the workshop meet specified quality standards, there should then be no errors or flaws in materials entering the production line. Once materials begin entering production, however, quality errors may begin developing. Therefore, there is the need for the workshop to periodically check or inspect work which is in some state of completion.

In-process inspection is performed on the production line as the product is being worked on. Advantages of inspecting on the production line include: the immediacy with which problems of quality can be pinpointed and the savings gained by not having to disassemble completed units or open sealed cartons filled with completed units. For maximum effect, inspection points should be designed into the production line as it is being laid out. The most rigorous inspection should be performed during the in-process inspection. It is during this time that problems can be most easily corrected with the least expense to the workshop.

What is meant by inspection? Simply stated, inspection is a routine procedure for closely observing and measuring the one or more critical quality dimensions leading to a judgment of "good" or "bad" for the piece of product inspected. Inspection is useful for identifying sources of defects and the people responsible. When it has done this, management can then act promptly to prevent recurrence of the trouble. The following are some of the more common sources of quality trouble: design errors; errors in establishing tolerences; errors in production planning and routing; workers attitudes, skill deficiencies or use of wrong methods; defects in raw materials or purchased parts; poor working conditions such as bad lighting; and use of wrong or inadequate machine or tooling for the production job to be done. Because these sources of quality trouble are common occurrences in workshops, inspection points should be designated on the specifications sheets.

What then should the workshop concern itself with when determining quality specifications for materials in-process?

- What process (method) will be used to manufacture the product(s)?

  The specifications sheet should describe in detail the method for manufacturing the product(s). This information is needed by industrial

engineers or time study personnel so as to establish time standards and subsequent costs related to the job. The information also serves to assist supervisors in correctly setting up the job.

The quality of products while being produced is known as process quality control. Process quality control is the procedure for determining whether the product or service being manufactured by the workshop meets acceptable quality standards. For example, process quality control can be used by a laundry department to check whether correct amounts of detergent are being placed into washing machines.

When the contract does not have a specific method or process for completing a job, then the workshop must determine how it will complete the job. This information is necessary for the workshop to (1) determine if it is able to complete the job, and (2) accurately determine costs for doing the job.

- Will this process contribute to the necessary level of quality?

  This is an important question which the workshop must be able to answer in the positive. It does not need to appear on the job specifications sheet. If uncertainty exists, then the workshop should either devise another process or refine the existing one. Regardless, the process must work or the workshop will turn out poor quality products.

- How many inspection points are required by the contractor?

  If the job is one which was previously done elsewhere, the workshop may be able to obtain information on the number and location of inspection points. Caution should be exercised because the workshop may be bidding on the job because quality was poor at the other job site. When detailing the process for the job on the specifications sheet, include the inspection points. Details related to the inspection points can be written elsewhere on the sheets. Inspection points to consider for work in-process include the following: (1) before or after key operations where there is a high probability of defects (at machinery), (2) before costly operations, (3) wherever succeeding operations would conceal defects, (4) at the last step of any series of operations that are logically grouped, (5) after each set-up of a job on a machine, (6) anywhere along a single fabrication or assembly line, and (7) at the close of departmental responsibilities.

- Is this a sufficient number of inspection points for the facility?

  Again, this is a question which need not appear on the specifications sheet; rather, the workshop should be comfortable with the number of inspection points normally used in connection with the job.

- Are additional inspection points required of the facility as a result of employing handicapped persons?

  If yes, then add these inspection points to the process specifications. Remember the workshop accepts a job with the understanding that it will turn out acceptable quality products. If this requires additional inspection points, then so be it. This is not to say that some inspection points cannot be eliminated once the handicapped persons have been trained for their job tasks. In fact, inspection points may "float" throughout the job. When a new handicapped person has been placed on a job task, his work may be inspected until training has been successfully completed.

- Does the manufacturing process need to be modified to provide inspection at key points?

  The workshop may find that the most appropriate manufacturing process will not meet the quality requirements desired and thus will have to modify the process. This could be due to (1) the type of machinery being used, or (2) the skills and capabilities of the handicapped individuals who will be assigned to the job. If the process needs to be adjusted, then the workshop should make changes on the specifications sheet. Changes made in operation method after the job has started will result in lost time and additional expenses.

- Will key inspection points create bottlenecks in the manufacturing process?

  The inspection of work in process may create places where work slows. Bottlenecks may occur. If the workshop is able to determine those inspection points which may result in bottlenecks, it may be possible to eliminate them by means of line-balancing. The workshop could add a second individual as inspector of work at a particular inspection point which would maintain the work flow.

- What are the inspections to be made?

  Specify the inspections which will need to be made while the work is in-process. When detailing the inspections on the specifications sheets, be sure to include information as to the method of inspection which will be used. For example, the workshop may find it necessary to inspect each piece. Keep in mind that this is a costly method of inspection. A more economical and practical method is the technique of sampling. With this method, samples (or pieces) of work are selected for inspection. When describing the inspections specify: the tolerances which are acceptable, the number of defects which will be allowed per batch or lot, what must be inspected, when the inspections are to be completed, and the individuals (by name or title) designated to perform the inspections.

Note: The workshop may have a rule that the first piece must be inspected. The supposition is that if the first piece is correct, the machine is correctly set up. The employee has understood his job instructions and has

transferred these to his machine. This assumption can be wrong if both the machine operator and the inspector misinterpreted the specifications or blueprints. The workshop may find that the machine needs fine adjustment after turning out 1,000 pieces. In other words, an acceptable first piece does not necessarily guarantee a correct final piece.

- Can defective products be reinserted back into the manufacturing process or must they be reworked individually?

  When defective products, due to their physical makeup, must be reworked, additional costs are borne by the workshop in correcting the mistakes. If the workshop received incorrect specifications from the contractor, then rework costs will most often be absorbed by the contractor. When deciding how defective products will be reworked, the workshop can select from (1) reworking individually, or (2) reinserting back into the manufacturing process. Neither method will necessarily consume less time than the other but the workshop should decide on one and specify it on the job specification sheets. This information is useful and pertinent for supervisors assigned to the job and for time study personnel.

- Who determines acceptable quality standards for materials and supplies in process?

  The job specification sheets should specify who determines acceptable quality standards. Quality can be determined by (1) the customer, (2) the workshop, or (3) the customer together with the workshop.

- How will the operator determine acceptable quality?

  The specifications sheets should specify in detail the method for determining acceptable quality. This may mean providing specifications of quality for a completed product or it may mean providing specifications of quality at various places during the processing of the work. Time study personnel need such information in order to prepare accurate times for completing the work.

- Which product flaws are acceptable and which are unacceptable?

  Specify flaws which are acceptable to the contractor (or customer) and which are not acceptable. For example, small scratches may be acceptable while large ones will not be acceptable. To aid production workers in identifying acceptable/unacceptable flaws, describe the flaws in detail on the specification sheet. Blueprints or photographs of flaws may help.

C. Quality Control Requirements for Completed Products

Outgoing quality control is the final quality check on a product. This is sometimes referred to as a "final or shipping inspection." It provides the workshop with a final opportunity to find defects before the product is delivered to the customer. Outgoing quality control is necessary even though

the raw materials (incoming quality control) and the product (process quality control) have already been monitored for acceptable quality because when the incoming materials and products were inspected these inspections covered specific checks on the products at a past point in time. Something could have happened to the product after having been placed into storage. For example, cardboard containers could now be crushed as a result of improper stacking. These containers must be replaced before shipping. In this situation and others, outgoing quality control will prove to be a necessary final check. During this final check on quality, final packaging and count can be inspected to assure that proper quantities, packing procedures, and shipping instructions are all according to the contract. This final inspection is much less rigorous than the receiving or in-process inspections unless the workshop suspects problems may have occurred. The specifications sheet then should include the following information:

- Who determines acceptable quality standards of completed products?

  Specify whether (1) the customer, (2) the workshop, or (3) the customer together with the workshop will determine what constitutes acceptable quality for completed products.

- What inspections are to be made prior to shipment?

  Specify in detail each of the inspections which must be completed prior to shipment. This information is important to workshop time study personnel because the costs of final inspections must be built into the contract bid proposal.

D. Manufacturing Requirements for Processing the Job

Overlapping occurs between manufacturing requirements for materials and for processing the materials. When equipment, tools, and machinery are properly selected to handle materials and supplies required for the job, then the products can be completed according to the specifications. Thus, manufacturing equipment, tools, and machinery needed for the contract job must be planned according to three basic factors:

(1) Can the equipment do the job?

If the equipment cannot deliver the required quality and quantity, neither the customer nor the workshop will be satisfied. Also, the workshop will lose the contract or be required to rework the defective products--both of which are costly to the workshop. Equipment must be selected so that production outputs, quality needs, financial limitations, and worker safety needs are taken into consideration.

(2) Is the equipment available?

Even though the workshop may have the necessary equipment, it may be unavailable due to it being required on other jobs. Equipment planning must be coordinated between jobs (production

scheduling) so that all contracts are assured an acceptable level of quality.

(3) Can workers operate the equipment consistently and safely?

Workshops should select equipment that can be operated consistently by workers without high levels of maintenance, easily maintained by the operator with training, and does not cause unwarranted safety problems. Down time increases the time required to complete the job. Injuries from unsafe equipment also increase the amount of time required to complete the job.

Once the workshop has determined that the equipment can complete the work per specifications, is available for use, and can be operated consistently and safely by the workers, then the following specifications can be answered:

- What are the requirements of inventory control?

For each job undertaken by the workshop, a determination will need to be made as to whether an inventory control system will need to be developed. Small, one-time contracts may not need any inventory control. Large contracts and/or ongoing contracts most often require some type of inventory control. If the contractor does not require inventory control records, the workshop may desire to establish its own internal inventory control system. Why? To provide structured control by management over materials and products within the confines of the workshop. An ongoing inventory control system alerts the management to quantities of products damaged, missing due to theft or errors in recording/counting, or in need of replenishment if production quotas are to remain at a constant level. There are several inventory systems from which the workshop can select. More information can be obtained by referring to the many books available in public libraries on the subject of inventory control.

Regardless of the inventory system adopted by the workshop, there are a number of specifications related to inventory control which the workshop will want to determine.

- Is information related to inventory to be given to the contractor, and if so, what information will be given to the contractor?

If the contractor instructs the workshop as to the information needed, then the workshop should so state on the specifications sheet. Otherwise, the workshop may consider giving any or all of the following information to the contractor: raw materials on hand, goods in process, completed products on hand in the workshop, and total number of products completed and sent to the contractor. Other information may include: defective materials on hand and number of defective completed products.

- How and when is inventory information to be given to the contractor?

Specify the method of informing the contractor--verbally (telephone) or written. Specify if notice is to be given daily, weekly, monthly, or

at some other interval. This information provides clues as to how often inventory records are to be updated.

- What are the requirements of materials handling and storage of finished products?

  The requirements of materials handling for any contract is most often the responsibility of the workshop. The contractor does not care to state how the raw materials must be moved throughout the workshop. He cares only that the materials do not become damaged during the moves. The storage of finished products while awaiting shipping may need to meet the contractor's specifications. Although damages may be the responsibility of the workshop, the contractor does not want to have delays in shipping completed products simply due to damage of products while in storage. Damaged products mean that shipping schedules can be delayed. When determining the specifications for handling the finished products and for storage, include information on the following: are products to be handled by hand, by hand trucks, by forklift, or by some other means; are products to be stored on pallets, placed in bins, etc.; are products to be covered by plastic or canvas to prevent dust from settling; and, are any climate conditions preferred for products in storage, such as air-conditioning or heating to a preferred temperature. Precautions must be taken to prevent products from being damaged while still in the confines of the workshop.

- How are completed products to be packaged for shipment?

  Specify the method for packing completed products for shipment to the contractor--i.e., banding, metal bins, cardboard containers, or some other means. This information is necessary for the shipping clerk.

- What skills are required of employees assigned to the job?

  Specify the skills required of employees to be assigned to the job. Include information on: aptitudes important to the job, level of dexterity required, vision, tolerances, etc. Jobs requiring skills above workshop capability obviously cannot be completed by the workshop unless individuals having those skills are brought into the workshop.

SUMMARY

This publication provides rehabilitation workshop personnel with basic information on job specifications. With an understanding of what is or can become a job specification, the workshop should be better prepared to analyze the requirements of the job. The more detailed the specifications of the job, the easier it will be to determine if the job can be completed by the workshop and the costs necessary to complete the job.

Job specifications are accurate descriptions of the technical requirements for products, services, or materials. They can assume the form of diagrams, drawings, industrial standards, or written descriptions. Six important reasons for having job specifications were discussed in the publication. Documented job specifications (1) provide information to the workshop in its determination as to whether it wants the job, can complete the job correctly, or can financially benefit from the job; (2) assist the workshop during production scheduling, when purchasing materials, and in the selection of employees for the job; (3) reduce job parts errors while increasing efficiency on the job; (4) reduce individual errors associated with what is meant by acceptable production; (5) make individual employees responsible for maintaining acceptable work tolerances; and (6) provide valuable information for future jobs which are similar and reduces the need for recomputation of materials and manufacturing specifications.

The subject of how-to-document job specifications was approached from the standpoint of the support service restrictions placed upon the materials and process required of a job. Three support service areas were discussed: shipping/receiving, quality control, and manufacturing. The publication discussed the job specifications related to each of the subject areas. Finally, a checklist was provided so that workshops had information already in a usable form.

Determining job specifications is an ongoing process for the workshop. As contractors approach the workshop with new jobs, new specifications will need to be determined. The more information that can be determined, the more accurate the bid price will become. This only helps the workshop in its endeavors to become a business within the community.

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CHECKLIST

SHIPPING/RECEIVING REQUIREMENTS FOR INCOMING MATERIALS

1. How are materials and parts to be shipped to the workshop?

   By contractor's vehicle
   By workshop's vehicle
   By vendor's vehicle
   By common carrier

2. Who secures common carrier?

   Workshop
   Contractor

3. What are the expected dates of shipping/receiving of incoming materials?
4. When are the materials to be shipped from their points of origin?
5. When are the materials expected to arrive at the workshop?
6. What are the points of origin for incoming raw materials?
7. What is being delivered to the workshop?
8. What method(s) of packing are to be used when transporting materials to the workshop?
9. Is special handling or added freight insurance required for the materials?

QUALITY CONTROL SPECIFICATIONS FOR INCOMING MATERIALS

1. What are the materials - describe?
2. Is one type or brand recommended or preferred over another?
3. Can materials be substituted without affecting quality?
4. Are the materials compatible with workshop methods of operations?
5. Which materials flaws are acceptable and which are unacceptable?
6. Who determines acceptable quality standards for incoming raw materials?

   Contractor determines quality standards
   Workshop determines quality standards
   Contractor and workshop determine quality standards

MANUFACTURING SPECIFICATIONS OF MATERIALS

1. Are inventory control records to be maintained for materials and supplies?
2. Is a specific type of inventory control system required?
3. Is a method of reporting inventory to the contractor required?
4. How are the materials and supplies to be handled?
5. How and where are materials and supplies to be stored?
6. How are materials and supplies to be laid out for the job?
7. What are the specifications of tools, equipment, or machinery necessary to turn materials and supplies into finished products?

SHIPPING/RECEIVING SPECIFICATIONS FOR OUTGOING COMPLETED PRODUCTS AND UNUSED MATERIALS AND SUPPLIES

1. What raw materials, etc., are to be returned and to where?
2. How are raw materials to be shipped?

   Contractor's vehicle

   Workshop's vehicle

   Vendor's vehicle

   Common carrier
3. How are unused materials to be packaged?
4. When are unused materials to be returned?
5. How are finished goods to be shipped to the contractor?
6. Where are finished products to be shipped?
7. When are finished products to be shipped/when must they arrive at the point of destination?
8. What finished products are to be shipped? Describe.
9. What method of packing is to be used during shipping?
10. Is special handling or added freight insurance required for shipping finished products?

QUALITY CONTROL REQUIREMENTS OF MATERIALS IN-PROCESS

1. What process (method) will be used to manufacture the products?
2. Will this process contribute to the necessary level of quality?
3. How many inspection points are required by the contractor?
4. Is this a sufficient number of inspection points for the workshop?
5. Are additional inspection points required of the workshop as a result of employing handicapped persons?
6. Does the manufacturing process need to be modified to provide inspection at key points?
7. Will key inspection points create bottlenecks in the manufacturing process?
8. What are the inspections to be made?
9. Can defective products be reinserted back into the manufacturing process or must they be reworked individually?
10. Who determines acceptable quality standards for materials and supplies in-process?
11. How will the operator determine acceptable quality?
12. Which product flaws are acceptable and which are unacceptable?

QUALITY CONTROL REQUIREMENTS FOR COMPLETED PRODUCTS

1. Who determines acceptable quality standards for completed products?

   Contractor

   Workshop

   Contractor and workshop

2. What inspections are to be made prior to shipment?

MANUFACTURING REQUIREMENTS FOR PROCESSING THE JOB

1. What are the requirements of inventory control related to materials in-process and to completed products?
2. Is information related to inventory to be given to the contractor, and if so, what information is to be given to the contractor?
3. How and when is inventory information to be given to the contractor?

4. What are the requirements of materials handling and storage of finished products?

5. How are completed products to be packaged for shipment?

6. What skills are required of employees assigned to the contract job?

   Vision

   Dexterity

   Aptitudes

FREIGHT SPECIFICATION SHEET

Job: _____ Date: _____

1. Point(s) of Origin for Goods Incoming:

2. Point(s) of Destination for Goods Shipped:

3. Destination of Materials to be Received:

4. Description of Materials to be Shipped:

5. Mode of Transportation:

6. Method of Packing/Shipping:
   (i.e., pallets, boxes/air freight, truck)

7. Weight and Quantity of Materials:

8. Estimated Freight Charges:

9. Name and Address of Freight Handlers:

10. Time Information Guaranteed for Accuracy: